KUMARAGURU
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B.E. DEGREE EXAMINATIONS: NOV/DEC 2023

(Regulation 2018)

Third Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

U18EET3004**:** Measurements and Instrumentation

COURSE OUTCOMES

CO1: Choose appropriate instruments for measuring electrical quantities.

CO2: Calculate the circuit parameters R,L,C using bridges.

CO3: Illustrate the concept of digital measurement system.

CO4: Describe the function and working of various transducers for measuring physical quantities.

CO5: Describe the role of intelligent sensor and data acquisition system for effective measurement and data storage.

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

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1.	Define sensitivity of an instrument.	CO1	[K$_2$]
2.	Compare Moving coil with Moving iron instruments.	CO1	[K$_2$]
3.	What is the difference between Maxwell's bridge and Anderson's bridge?	CO2	[K$_3$]
4.	What are the limitations of the Wheatstone bridge?.	CO2	[K$_2$]
5.	What are the advantages of a power analyzer?	CO3	[K$_1$]
6.	Mention the various components of digital electronic Multimeter.	CO3	[K$_2$]
7.	What are the differences between Thermistor and Thermocouple?	CO4	[K$_2$]
8.	What is the principle of pyrometer?	CO4	[K$_2$]
9.	Mention the application of MEMS sensor.	CO5	[K$_3$]
10.	What are the features of data logging?	CO5	[K$_3$]

Answer any FIVE Questions:-

PART B (5 x 16 = 80 Marks)

(Answer not more than 400 words)

11.	a)	Explain the construction and operation of PMMC instrument with neat circuit.	8	CO1	[K2]
	b)	Draw the construction diagram and derive the torque expression for induction type single phase energy meter.	8	CO1	[K3]

12.	a)	Calculate the current through the galvanometer for the bridge shown in fig. Using thevenin equivalent circuit.	8	CO2	[K3]
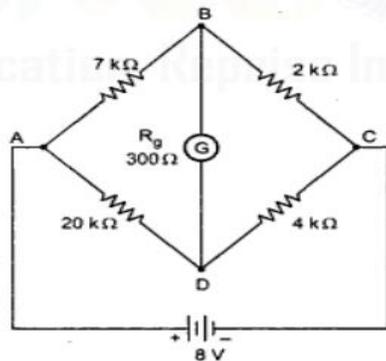
	b)	Explain how a Maxwell bridge can be used for measuring an unknown inductance.	8	CO2	[K2]

13.	a)	Explain the working principle and characteristics of Harmonic Analyzer with neat diagram.	8	CO3	[K2]
	b)	Draw the block diagram of digital frequency meter and explain.	8	CO3	[K2]

14.	a)	Explain the construction and principle of working of a LVDT.	8	CO4	[K2]
	b)	What is called piezo-electric transducer? Explain its working with neat diagram	8	CO4	[K2]

15.	a)	Describe in detail about the successive approximation method of ADC.	8	CO5	[K2]
	b)	Explain the block diagram of a digital data acquisition system.	8	CO5	[K2]

16.	a)	Draw the circuit and derive the expression for frequency of Wein bridge.	8	CO2	[K2]
	b)	What are the different types of errors in measurements? Explain	8	CO1	[K2]

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